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Heartbeat Stars and the Ringing of Tidally Induced Pulsations

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Abstract. With the advent of high precision photometry from satellites such as *Kepler* and CoRoT, a whole new layer of interesting and astounding astronomical objects has been revealed: heartbeat stars are a prime example of such objects. Heartbeat stars are eccentric ellipsoidal variables that undergo strong tidal interactions at the time of closest approach, when the stars are almost in contact. These interactions cause a significant variation in the surface areas of the stars and are observed in the form of a tidal pulse. A subset of these objects (∼20%) show prominent tidally induced pulsations. We now have a fully functional code that models binary star features (using PHOEBE) and stellar pulsations simultaneously, enabling a complete and accurate heartbeat model to be determined. In this talk we show the results of our new code, which uses *emcee*, a variant of MCMC, to generate a full set of stellar parameters. We further highlight some of the interesting features of selected heartbeat stars, including resonant pulsations, frequency modulation, solar-like oscillations, and resonantly locked modes.